REMARKS

This paper is in response to the Office Action dated April 5, 2006. Applicants have amended the application as set forth above. Specifically, Claims 1, 3, 4, 19-25, 32, 34 and 35 has been amended. Claims 1-35 remain pending in this application. No new matter is added by the amendments as discussed below. Applicants respectfully request the entry of the amendments and reconsideration of the application in view of the above amendments and the following remarks.

Discussion of Amendments to the Claims

Claims 1 has been amended to change language in the preamble in view the amendments to Claims 3, 20, 23 and 34 as depending from Claim 1. Claim 3 has been amended to depend from Claim 1 and to delete certain features. Certain language of Claim 4 has been amended in view of the change of dependency of Claim 3. Claim 19 has been amended to recite additional features, which are supported by, for example, Claim 1. Claim 20 has been amended to depend from Claim 1 and to delete certain features. The preamble of Claim 21 has been amended in view of the amendments to Claim 20. Claim 22 has been amended to depend from Claim 20 and to delete certain features. Claim 23 has been amended to depend from Claim 1. Claims 24 and 25 have been amended to change certain language in view of the change of the dependency. Claim 32 has been amended to add additional features, which are supported by, for example, Claim 1. Claim 34 has been amended to depend from Claim 1. Claim 35 has been amended to depend from Claim 34. As such, all the changes are supported by the original specification and claims. Applicant respectfully requests the entry of the amendments.

Discussion of Rejection Under 35 U.S.C. § 102

The Examiner rejected Claims 1 and 3-35 under 35 U.S.C. § 102(b) as being anticipated by Daugman (U.S. Patent No. 5,291,560). However, Daugman does not anticipate these claims as discussed below.

The Law of Anticipation

Anticipation under Section 102 can be found only if a reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner, 778 F.2d 775 (Fed. Cir. 1985).* More particularly, a

finding of anticipation requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention. *Electro Med. Sys. S.A. v. Cooper Life Sciences, 34 F.3d 1048, 1052 (Fed. Cir. 1994).* "To anticipate, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim." *Brown v. 3M, 265 F.3d 1349 (Fed. Cir. 2001).* "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson, 424 F.2d 1382, 1385 (CCPA 1970).*

Disclosure of Daugman

Daugman discloses an iris recognition system, which obtains and processes an image of an eye. As part of the processing, Daugman teaches a method of locating two boundaries of the iris, which are a pupillary (inner) boundary and a limbic (outer) boundary. Both the inner and outer boundaries are detected by finding an abrupt and sudden change in brightness summed along each of 'exploding circles' whose radii are steadily increasing. *See* col. 5, lines 31-60 and col. 7 lines 6-30. Specifically, for each exploding circle, and for each value of radius, the total image brightness is summed over a fixed number of points, for example 128 points, lying on the circle. The maximum rate of change in this brightness, as the radius steadily expands, represents the boundaries of the iris. *See* col. 5, lines 42-60. One difference between detections of the inner and outer boundaries is that in locating the outer boundary, the brightness is summed along two horizontally exploding pie wedges of the exploding circles whereas in locating the inner boundary the brightness is summed along the whole exploding circles. *See* col. 7, lines 24-26. This is because eye images to be processed may not contain the outer boundary in its entirety while containing two horizontally exploding pie wedge portions.

As discussed, Daugman determines the outer boundary of the iris by obtaining brightness summed along exploding pie wedges and comparing the brightness against each other. Daugman does not teach or suggest any methods or processes that determine~~determining~~ the outer boundary using image information of inner boundary.

Daugman Does Not Anticipate Claim 1

Claim 1 is directed to a method of processing an image of an eye. The method comprises providing data representing an image of an eye comprising an image of an iris of the eye and providing location information of the inner boundary of the iris image. The method further comprises comparing the image information of a pixel on the inner boundary with the image

information of pixels of the eye image, and determining a pixel is on the outer boundary of the iris image when a difference between the image information of that pixel and the image information of the pixel on the inner boundary becomes a maximum among differences of the image information.

As discussed above, Daugman does not teach or suggest determining the outer boundary using image information of inner boundary. Thus, among other features of the claim that Daugman does not teach or disclose, Daugman discloses or teaches neither (1) comparing the image information of a pixel on the inner boundary with the image information of pixels of the eye image, nor (2) determining whether a pixel is on the outer boundary of the iris image when a difference between the image information of that pixel and the image information of the pixel on the inner boundary becomes a maximum among differences of the image information. As such, Daugman does not anticipate Claim 1 and its dependent claims, Claims 2-18, 20-31, 34 and 35.

Daugman Does Not Anticipate Claim 19

Claim 19 is directed to a device for processing an image of an eye. The device comprises means for providing data representing an image of an eye comprising an image of an iris of the eye, and means for providing location information of the inner boundary of the iris image. Further, Claim 19 comprises means for comparing the image information of a pixel on the inner boundary with the image information of pixels of the eye image, thereby determining a pixel is on the outer boundary of the iris image when a difference between the image information of that pixel and the image information of the pixel on the inner boundary becomes a maximum among differences of the image information. Additionally, the device comprises means for obtaining data of a substantial portion, but not all, of the iris image, and means for processing the data of the substantial portion to obtain an iris pattern.

As discussed above, Daugman does not teach or suggest determining the outer boundary using image information of inner boundary. Thus, among other features of the claim that Daugman does not teach or disclose, Daugman does not disclose or teach means for comparing the image information of a pixel on the inner boundary with the image information of pixels of the eye image, thereby determining whether a pixel is on the outer boundary of the iris image when a difference between the image information of that pixel and the image information of the

pixel on the inner boundary becomes a maximum among differences of the image information. As such, Daugman does not anticipate Claim 19.

Daugman Does Not Anticipate Claim 32

Claim 32 is directed to an eye image processing system. The system comprises means for providing data representing an image of an eye comprising an image of an iris of the eye and means for providing location information of the inner boundary of the iris image. The system further comprises means for comparing the image information of a pixel on the inner boundary with the image information of pixels of the eye image, thereby determining a pixel is on the outer boundary of the iris image when a difference between the image information of that pixel and the image information of the pixel on the inner boundary becomes a maximum among differences of the image information. Additionally, the system comprises means for identifying data of the iris image, and means for producing at least one modified iris image data based on the data of the iris image.

Again, among other features of the claim that Daugman does not teach or disclose, Daugman does not disclose or teach means for comparing the image information of a pixel on the inner boundary with the image information of pixels of the eye image, thereby determining whether a pixel is on the outer boundary of the iris image when a difference between the image information of that pixel and the image information of the pixel on the inner boundary becomes a maximum among differences of the image information. As such, Daugman does not anticipate Claim 32 and it dependent claim, Claim 33.

Discussion of Rejection of Claim 2 Under 35 U.S.C. § 103

The Examiner rejected Claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Daugman. As discussed below, however, the claim is patentable over the reference.

Standard for Obviousness Rejection

The Patent and Trademark Office has the burden under section 103 to establish a *prima facie* case of obviousness. *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-87 (Fed. Cir. 1984). To establish a *prima facie* case of obviousness, three basic criteria must be met: first, the prior art reference (or references when combined) must teach or suggest all the claim limitations; second, there must be some suggestion or motivation, either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; finally, there must be a reasonable expectation of success. *See* M.P.E.P. § 2143.

No *Prima Facie* Case of Obviousness Has Been Established

Claim 2 depends from Claim 1 and accordingly incorporates all the features of Claim 1. For the sake of convenience, Applicant discusses the patentability of the claim with the features recited in Claim 1.

As discussed above in connection with the discussion of rejection under § 102(b), Daugman teaches or suggests neither (1) comparing the image information of a pixel on the inner boundary with the image information of pixels of the eye image nor (2) determining a pixel is on the outer boundary of the iris image when a difference between the image information of that pixel and the image information of the pixel on the inner boundary becomes a maximum among differences of the image information.

In rejecting Claim 2, the Examiner took an official notice on the Canny edge detection. However, the teaching of Canny edge detection does not remedy the deficiencies of Daugman. Therefore, the combination of Daugman and the Examiner's official notice still does not teach every limitation of Claim 1. For this reason, there is no *prima facie* case of obviousness against Claim 1 and therefore its dependent claim, Claim 2.

Dependent Claims

Although Applicant has not addressed all the issues of the dependent claims, Applicant respectfully submits that Applicant does not necessarily agree with the characterization and assessments of the dependent claims made by the Examiner, and Applicant believes that each claim is patentable on its own merits. Claims 2-18, 20-31 and 33-35 are dependent either directly or indirectly on the above-discussed independent Claims 1, 19 and 32. Applicant respectfully submits that pursuant to 35 U.S.C. § 112, ¶4, the dependent claims incorporate by reference all the limitations of the claim to which they refer and include their own patentable features, and are therefore in condition for allowance. Therefore, Applicant respectfully requests the withdrawal of all claim rejections and prompts allowance of the claims.

CONCLUSION

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. In light of the above amendments and remarks, this application is in condition for allowance. If the Examiner has any questions which may be answered by telephone, he is invited to call the undersigned directly.

Respectfully submitted,

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